

CLAIMS

1. Device for blocking a fuel assembly (A1, A2, A3) in a housing (L1, L2, L3) of a transport basket, the assembly comprising an upper end piece (ES1, ES2, ES3) and the housing comprising a first open end and a second end, the device being characterised in that it comprises means (10, 10', 10") capable of making a rigid connection between the upper end piece (ES1, ES2, ES3) of the fuel assembly and the open end of the housing (L1, L2, L3), in a predetermined relative position such that the assembly bears in contact with at least one face of the housing on at least part of its length, the said means capable of making a rigid connection being placed above the upper end piece of the assembly.

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2. Device according to claim 1, in which the fuel assembly (A1, A2, A3) and the housing (L1, L2, L3) have polygonal sections and the said predetermined relative position is such that the upper end piece (ES1, ES2, ES3) is bearing in contact with the two adjacent faces of the housing.

25 3. Device according to claim 2, in which the fuel assembly (A1, A2, A3) and the housing (L1, L2, L3) have square sections.

4. Device according to any one of the previous claims, in which the device also comprises a part (12) of the housing (L1, L2, L3) with a smaller section,

located close to the second end of the housing, the said part with a smaller section having dimensions approximately equal to the dimensions of the lower end piece (EI) of the fuel assembly.

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5. Device according to any one of the previous claims, in which the said predetermined relative position is such that the fuel assembly is suspended by the upper end piece.

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6. Device according to any one of the previous claims, in which the said means (10, 10', 10") capable of making a rigid connection comprise a connecting device (14, 14', 14") that can be fixed on the upper 15 end piece (ES1, ES2, ES3) of the assembly by first clamping means (78, 94, 140) and that can be fixed in the open end of the housing (L1, L2, L3) by second clamping means (24, 26, 62, 102, 104, 119).

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7. Device according to claim 6, combined with either claim 2 or 3, in which the connecting device (14, 14', 14") includes means of transverse displacement (58, 114, 142) that can move the upper end piece (ES1, ES2, ES3) of the assembly towards the two 25 adjacent faces of the housing (L1, L2, L3) and away from them.

8. Device according to any one of the previous claims, in which the connecting device (14, 14', 14") 30 includes means of axial displacement (38 and 42, 94, 140) that can move the assembly (A1, A2, A3) away from

the second end (F) of the housing (L1, L2, L3) and towards the said second end.

9. Device according to claims 7 and 8 combined, in  
5 which the first clamping means (78), the second  
clamping means (24, 26), the transverse displacement  
means (58) and the means of axial displacement (38, 42)  
are activated by separate control devices (72, 27, 50,  
34) that can be manoeuvred separately.

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10. Device according to claim 9, in which the connecting device (14) has a longitudinal axis (22) can be oriented parallel to the longitudinal axis of the fuel assembly (A1), and the first clamping means comprise jaws (78) that can move onto a first part (64) of the connecting device along directions approximately radial with respect to the said axis, the second clamping means comprise a bayonet ring (20) that can rotate about a second part of the connecting device (14) about the said axis, the axial displacement means comprise means (38, 42) of controlling a relative displacement between the first part and the second part along the said axis and the transverse displacement means comprise at least one sliding block (58) that can move onto the first part (64) of the connecting device along a direction approximately radial with respect to the said axis, the said sliding block also forming part of the second clamping means.

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11. Device according to claims 7 and 8 combined,  
in which the said first clamping means (94), the second

clamping means (102) and the means of axial displacement (94) are activated by a single control device (80) and the transverse displacement means (114) are activated by another control device (116) that can 5 be manoeuvred separately from the single control device.

12. Device according to claim 11, in which the single control device (80) is a screw, anchored free to 10 rotate on the connecting device (14'), the said screw acting on thrust rods (94) forming firstly the first clamping means and secondly the means of axial displacement, and acting on jaws (100) forming the second clamping means, through control rods (86, 88, 15 106) articulated on the connecting device (14'), on a nut (84) engaged on the screw, on the thrust rods (94) and the jaws (100), and the transverse displacement means comprise thrust pads (114) anchored on the connecting device (14').

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13. Device according to claims 7 and 8 combined, in which the first clamping means (140), the transverse displacement means (142) and the means of axial displacement (140) are activated by a single control 25 device (120) and the second clamping means comprise a separate attachment device.

14. Device according to claim 13, in which the single control device (120) is a screw, anchored free 30 to rotate on the connecting device (14''), the said screw acting on claws (128) forming the first clamping

means, the means of axial displacement and the transverse displacement means, through a nut (126) engaged on the screw and on which the said claws are articulated.

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15. Method for blocking a fuel assembly (A1, A2, A3) in a housing (L1, L2, L3) of a transport basket, the assembly comprising an upper end piece (ES1, ES2, ES3) and the housing comprising a first open end and a second end (F), the method being characterised in that it consists of making a rigid connection between the upper end piece (ES1, ES2, ES3) of the fuel assembly and the open end of the housing (L1, L2, L3) above the upper end piece of the assembly, in a predetermined relative position such that the fuel assembly is not in contact with the bottom (F) of the housing and is either bearing in contact with at least one face of the housing or is bearing in contact with at least a part of the length of at least one face of the housing.

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16. Method according to claim 15, in which a lower end piece (EI) of the fuel assembly is placed in a part of the housing with a smaller section (12), located close to the second end of the housing, so as to hold the said lower end piece transversally in the housing.

17. Method according to either claim 15 or 16, in which the fuel assembly (A1, A2, A3) and the housing (L1, L2, L3) have polygonal sections and the said rigid connection is made in a predetermined relative position

such that the upper end piece (ES1, ES2, ES3) bears in contact with two adjacent faces of the housing.

18. Method according to claim 17, in which a  
5 connecting device (14) is fixed on the upper end piece (ES1) of the fuel assembly (A1) placed outside the housing (L1), the fuel assembly is then inserted equipped with the connecting device in the housing oriented approximately vertically, the upper end piece 10 (ES1) is applied in contact with the said two adjacent faces of the housing, then the connecting device (14) is fixed in the open end of the housing.

19. Method according to claim 17, in which a  
15 connecting device (14') is inserted above the upper end piece (ES2) of the fuel assembly (A2), the fuel assembly being placed in the housing (L2) oriented approximately vertically, the assembly is lifted while fixing the connecting device in the open end of the 20 housing, then the upper end piece (ES1) is applied in contact with the said two adjacent faces of the housing.

20. Method according to claim 17, in which a  
25 connecting device (14'') is inserted above the upper end piece (ES3) of the fuel assembly (A3), the fuel assembly being placed in the housing (L3) oriented approximately vertically, the connecting device is fixed in the open end of the housing, the upper end piece 30 (ES3) is bring into contact with the said two adjacent faces of the housing, then the assembly (A3)

is lifted and it is squeezed in contact with the connecting device (14") in contact with the said two adjacent faces of the housing.